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ABSTRACT

The educational problem that this paper addresses is how to summarize the constructivist framework reflected in student-centered learning approaches, in a way that provides educators with manageable guidelines for transforming classrooms into computer-supported learning environments. Fourteen values that summarize the constructivist framework are listed and briefly defined: active engagement; authenticity; collaboration; community; complexity; generativity; multiple perspectives; ownership; personal autonomy; personal relevance; pluralism; reflectivity; self-regulation; and transformation. It is suggested that the values provide a basis for evaluating instructional strategies aimed at fostering higher-order thinking skills and positive disposition toward learning, and that the values may lead to a set of guidelines for developing a wide variety of learning environments. Two figures illustrate the contemporary values of educational technology and constructivist values for developing higher-order thinking skills. (Contains 30 references.) (Author/MAS)

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Title:

Constructivist Values and Emerging Technologies: Transforming Classrooms into Learning Environments

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Abstract

This article lists and briefly defines fourteen values that summarize the constructivist framework. It is suggested that the values provide a basis for evaluating instructional strategies aimed at fostering higher-order thinking skills and positive disposition toward learning. It is further suggested that the values may lead to a set of guidelines for developing a wide variety of learning environments.

Constructivist Values and Emerging Technologies: Transforming Classrooms into Learning Environments

As emerging technologies offer the potential for designing highly engaging, student-centered learning environments and as the theory base for situated learning matures, a number of educational approaches have evolved that foster higher-order thinking skills and positive disposition toward learning. These include cognitive apprenticeship (Brown, Collins, & Duguid, 1989), anchored instruction (CTGV, 1990), The Community of Learners (Brown & Campione, 1990), and Computer-Supported Intentional Learning Environments (Bereiter & Scardamalia, 1992), to name a few. The educational problem that this paper addresses is how to summarize the constructivist framework reflected in these and related approaches, in a way that provides educators with manageable guidelines for transforming classrooms into computer-supported learning environments.

For purposes of the current presentation, higher-order thinking includes activities such as (a) critical thinking, defined as the process of figuring out what to believe or do about a problem for which no single definitive answer exists and as the process of evaluating the quality of text and other intellectual products, including one's own (Brown & Campione, 1990), (b) generative thinking, defined as the active process of using existing knowledge to make sense of new information necessary for meaningful learning, defined as the transition from declarative knowledge to use-oriented knowledge (Wittrock, 1991; Bransford & Vye, 1989), (c) problem-solving processes, defined as the application of current knowledge to delineate and think out a solution to a novel problem (Gagne, 1984), and (d) the use of cognitive and metacognitive strategies for achieving learning goals and exercising executive control of concentration, comprehension, and affect (Weinstein & Mayer, 1986; Corno, 1986, Shuell, 1986).

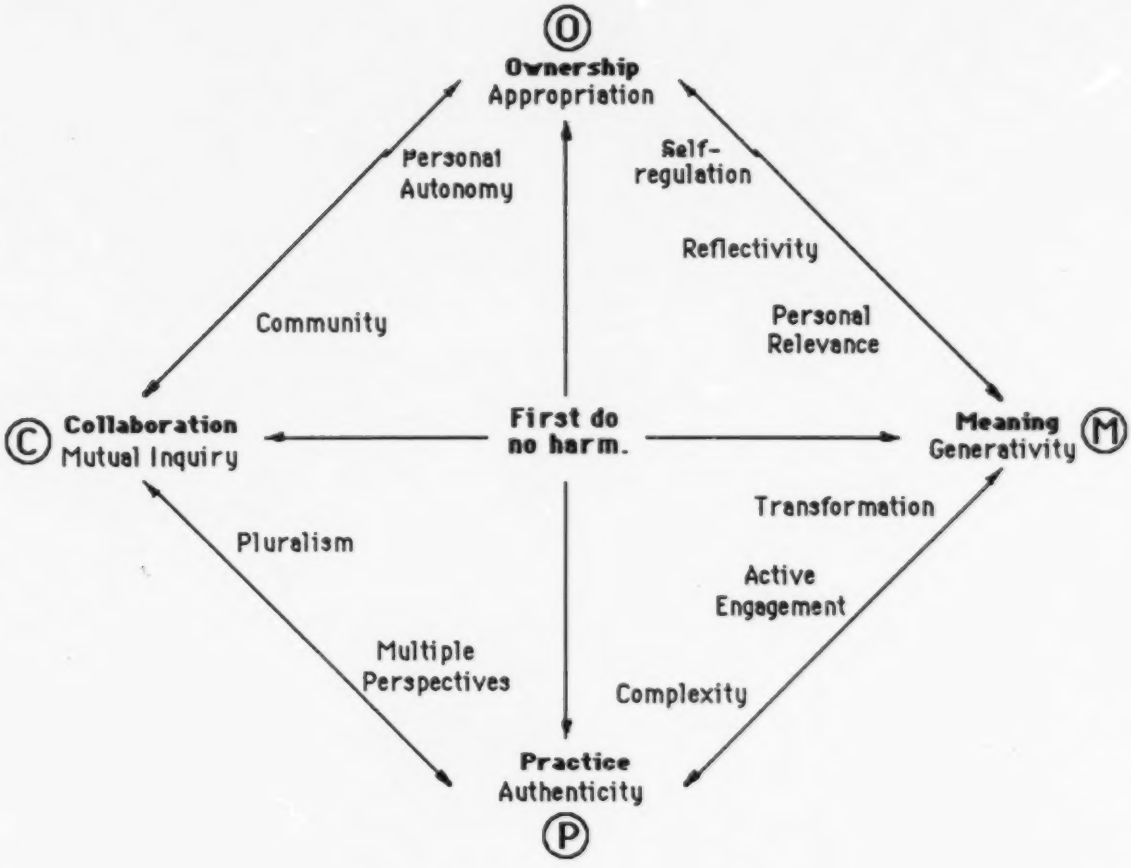
Positive disposition toward learning refers to individual differences in personal agency and learning orientation that influence students' perceptions of the learning situation, the quality of their cognitive engagement, and whether their learning activities lead to meaningful learning. Personal agency is the tendency for people "to take responsibility for their actions and ascribe success and failure to the goals they choose, the resources they mobilize, and the effort they expend" (Paris and Byrnes, 1989, p. 177). Learning orientation includes an individual's beliefs about the nature of knowledge and how it is acquired, the type of goal pursued by the individual on cognitive tasks, and the individual's perceptions about task requirements. It encompasses expectations, feelings, intuitions, attitudes, values, interests, intentions, significant relationships, and commitments (Vermunt, 1989).

Eisner (1988) has observed that the values we hold as educators influence our students in ways that crucially affect their development. He has proposed that "the methods we espouse, the way we define knowledge, the work we regard as respectable, reflect our conceptions of virtue, and the courses we teach, in turn, are designed to help students achieve such virtues" (p.19). Taylor and Swartz (1988) have argued that educational technology is not as value-neutral a method of conveying instructional information as has been commonly believed. Rather, educational technology has generally supported a set of values identified by Heinich (1984) as replicability, reliability, communication, and control (see Figure 1).

Figure 1. Contemporary values of educational technology as identified by Heinich, (1984).

In the face of what Doll (1989) has described as an emerging post-modern agenda for curriculum, an alternative (but not necessarily mutually exclusive) set of values has appeared (see figure 2). These values, as defined in the following section, come primarily from a review of literature in the areas of constructivist principles of teaching and learning, contemporary learning theories, achievement motivation (especially goal theory), collaborative learning environments, and the role of computers and related technology in education.

Figure 2. COMP: Constructivist values for developing higher-order thinking skills and positive disposition toward learning.



It should be noted that many of the values are consonant with elements of both experiential education, as advocated by Dewey (1972) and the progressive educators of the 1920s and 30s, and humanistic learning theory, as championed by Rogers (1963) and Maslow (1968).

1. Active engagement. A quality of mindfulness in learning situations that supports intentional learning by influencing the learning strategies the individual employs. Intentional learning refers to cognitive processes that involve purposeful processing of information to achieve a learning goal actively desired by the learner (Bereiter & Scardamalia, 1989).

2. Authenticity. A characteristic of learning environments that are designed to develop understanding through application and manipulation of knowledge within the context of the ordinary practices of the target culture (Brown et al., 1989). Authenticity is concerned not only with the similarity of the learning situation to the transfer environment, but also with the value learners attribute to the learning task and whether the learner practices what is essential for the transfer situation.

3. Collaboration. Various noncompetitive social interactions that affect cognitive development, viewed on a two dimensional scale ranging from high to low levels of united effort and continuous sharing and from symmetric to highly asymmetric relative expertise of participants (Granott, 1993). When mutual inquiry is the general framework for learning, traditional roles of teacher and student are largely replaced by a collaborative partnership in a many-sided inquiry into meaning (Doll, 1989).

4. Community. The emphasis in various conceptions of affiliated work that focus on jointly constructed public knowledge as opposed to individual knowledge (Brown & Campione, 1990). This

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orientation represents a fundamental change in education, where the goal is to transform classrooms into knowledge-building communities that allow students to contribute to each other's learning through the social construction of communal knowledge (Bereiter & Scardamalia, 1992).

5. Complexity. The view that reality is web-like, with multiple interacting forces (Doll, 1989) and that many areas of human endeavor, particularly those involving interaction between people, are ill-structured and characterized by a high degree of concept and case complexity and across-case irregularity (Spiro, Feltovich, Jacobson, & Coulson, 1991).

6. Generativity. The active process of using existing knowledge to make sense of new information necessary for meaningful learning. In generative teaching for understanding, the teacher's role is to help students build connections between their knowledge, beliefs, and experience on the one hand, and school subject matter on the other. Within this model, comprehension depends on the activities of the learner during instruction. The learner creates relations between prior knowledge and current experience by applying learning strategies such as elaborating with analogies, making inferences, paraphrasing, and summarizing (Wittrock, 1991).

7. Multiple perspectives. Experiencing the same material in a variety of different ways and for different purposes. Students develop flexible knowledge by experiencing multiple cases from multiple perspectives (Spiro et al., 1991).

8. Ownership. Experiencing the value of new understanding and the benefits of personal agency in developing commitment to meaningful learning goals and the ability to achieve these goals through self-regulation of the learning process.

9. Personal autonomy. The quality or condition of feeling in charge of the learning process as opposed to expecting others to direct it. Support of autonomy (as opposed to control) by providing choice, minimizing performance pressure, and encouraging initiation tends to support intrinsic motivation, meaningful learning, self-esteem and a variety of other factors relevant to the initiation and regulation of intentional learning (Deci & Ryan, 1987).

10. Personal relevance. Experiencing changes in perceptions, understandings, beliefs, feelings, and capabilities as a function of new information (as opposed to being told about its relevance). An individual's orientation toward learning is qualitatively different when learning is embedded in the context of achieving personally relevant goals that go beyond working for a grade or some distant, future goal (Berliner, 1992; Bransford, Franks, Vye, & Sherwood, 1989).

11. Pluralism. The belief that no single view of reality can explain all the phenomena of life, and, therefore, reality is, ultimately, the product of intersubjective agreement. From this perspective, each individual's perceptions have value and represent a basis for mutual inquiry, rather than an obstacle to be maneuvered around (Doll, 1989).

12. Reflectivity. Largely synonymous with metacognitive awareness, defined as the ability to plan, monitor, and modify cognitive processes for mental management or executive control of concentration, comprehension, and affect (Corno, 1986; Osman & Hannafin, 1992; Shuell, 1986). Students become increasingly responsible for learning through strategic exploration of errors and thoughtful consideration of their own and others' knowledge-construction activities.

13. Self-regulation. A form of cognitive engagement involving metacognitive, motivational, and behavioral dimensions for assuming personal responsibility for learning (Corno & Mandinach 1983; Zimmerman, 1989). Constructivists hold that the ultimate goal of education is to help students become masters of their own learning by supporting the progressive acquisition of the capability to self-regulate learning.

14. Transformation. A view of change that sees meaningful learning as the result of internal reorganization triggered by the learner or by the learner's reaction to external forces rather than a process of accumulating information in memory (Doll, 1989).

The development of guidelines based on this set of values represents a strategy for summarizing the constructivist framework in a way that can lead to a wide variety of learning environments and further provides a basis for evaluating instructional strategies (Savery & Duffy, in press). From another perspective, these values are concerned with epistemology, which as Bateson (1972) has suggested, ultimately defines the kind of world we live in.

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